

IN THE CLAIMS:

1 1. (Canceled)

1 2. (Canceled)

1 3. (Canceled)

1 4. (Canceled)

1 5. (Currently amended): For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

3 a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the plurality of
6 evaporation chambers;
7 a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each of the evaporation chambers has a respective average irrigation rate
9 and so varies as repeatedly to reach a respective peak irrigation rate that is at
10 least twice the average irrigation rate thereof, wherein the times at which the
11 rates of irrigation of some of the evaporation chambers reach their respective
12 peak irrigation rates are different from those at which others of the plurality of
13 evaporation chambers do; and
14 a vapor guide defining a vapor path along which it directs to the at least one
15 condensation chamber vapor thereby produced in the plurality of evaporation
16 chambers.

17 ~~An evaporator-and-condenser unit as defined in claim 39~~ wherein the irrigation
18 system further includes:

19 A) a main sprayer system, ~~that~~ which irrigates each said evaporation
20 chamber for at least the majority of the time; and

21 B) an auxiliary sprayer system, ~~that~~ which irrigates each ~~of said at least~~
22 ~~one evaporation chamber~~ the evaporation chambers for only a minority
23 of the time, the rate at which each said evaporation chamber is
24 irrigated while the auxiliary sprayer system is irrigating it being at
25 least twice the average irrigation rate thereof.

1 6. (Canceled)

1 7. (Currently Amended): An evaporator-and-condenser unit as defined in claim 47 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the ~~at least one evaporation chamber~~
4 evaporation chambers.

1 8. (Currently amended): An evaporator-and-condenser unit as defined in claim 5 wherein
2 the auxiliary sprayer system includes a plurality of auxiliary-system nozzles from which the
3 auxiliary sprayer system produces an auxiliary-system spray by which the auxiliary sprayer
4 system irrigates the ~~at least one evaporation chamber~~ evaporation chambers.

1 9. (Currently amended): An evaporator-and-condenser unit as defined in claim 5 wherein
2 the main sprayer system includes a plurality of main-system nozzles from which the main
3 sprayer system produces a main-system spray by which the main sprayer system irrigates the
4 ~~at least one evaporation chamber~~ evaporation chambers.

1 10. (Currently amended): An evaporator-and-condenser unit as defined in claim 5 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the ~~at least one evaporation chamber~~
4 evaporation chambers.

1 11. (Currently Amended): An evaporator-and-condenser unit as defined in claim ~~1-48~~ 48
2 wherein the heat exchanger is a rotary heat exchanger in which the heat-transfer surfaces are

3 mounted for rotation about a central cavity from which the irrigation system irrigates the at
4 ~~least one evaporation chamber~~ plurality of evaporation chambers.

1 12. (Currently amended): An evaporator-and-condenser unit as defined in claim 11 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the ~~at least one evaporation chamber~~
4 evaporation chambers.

1 13. (Canceled)

1 14. (Currently amended): An evaporator-and-condenser unit as defined in claim 48 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the ~~at least one evaporation chamber~~
4 evaporation chambers.

1 15. (Currently Amended): An evaporator-and-condenser unit as defined in claim 48
2 wherein:

3 ~~A) the evaporator and condenser unit includes a plurality of said evaporation~~
4 ~~chambers;~~

5 BA) the auxiliary sprayer system includes at least one auxiliary-system nozzle,
6 associated with at least some of said evaporation chambers, from which the
7 auxiliary sprayer system produces an auxiliary-system spray; and

8 CB) for each of the evaporation chambers with which the auxiliary-system nozzle
9 is associated, the auxiliary-system nozzle executes reciprocation between
10 positions in which the auxiliary-system spray irrigates that evaporation
11 chamber and positions in which the auxiliary-system spray does not irrigate
12 that evaporation chamber.

1 16. (Previously Presented): An evaporator-and-condenser unit as defined in claim 15 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the evaporation chambers.

1 17. (Canceled)

1 18. (Canceled)

1 19. (Currently amended): ~~compressor~~ For distilling a liquid, an evaporator-and-condenser
2 unit comprising:

3 A) a heat exchanger that forms at least one condensation chamber and at least one
4 evaporation chamber and includes heat-transfer surfaces by which heat passes
5 from the at least one condensation chamber to the at least one evaporation
6 chamber;

7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each said evaporation chamber has a respective average irrigation rate and
9 so varies as repeatedly to reach a respective peak irrigation rate that is at least
10 twice the average irrigation rate thereof, wherein the peak irrigation rate for
11 each said at least one evaporation chamber exceeds the steady-state rate
12 required to keep the heat-transfer surfaces thereof wetted, and the average
13 irrigation rate for each said at least one evaporation chamber is no more than
14 half the steady-state rate required to keep the heat-transfer surfaces of that
15 evaporation chamber wetted; and

16 C) a vapor guide defining a vapor path along which it directs to the at least one
17 condensation chamber vapor thereby produced in the at least one evaporation
18 chamber; and

19 D) ~~An evaporator and condenser unit as defined in claim 17~~ further including a
20 compressor so interposed in the vapor path as to make the vapor pressure in
21 the at least one condensation chamber exceed that in the at least one
22 evaporation chamber.

1 20. (Currently amended): For distilling a liquid, an evaporator-and-condenser unit
2 comprising:
3 a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the plurality of
6 evaporation chambers;
7 a varying-rate evaporation-chamber irrigation system whose rate of irrigation of
8 each said plurality of evaporation chambers has a respective average irrigation
9 rate and so varies as repeatedly to reach a respective peak irrigation rate that is
10 at least twice the average irrigation rate thereof, wherein the peak irrigation rate
11 for each said plurality of evaporation chambers exceeds the steady-state rate
12 required to keep the heat-transfer surfaces thereof wetted, and the average
13 irrigation rate for each said plurality of evaporation chambers is no more than
14 half the steady-state rate required to keep the heat-transfer surfaces of that
15 evaporation chamber wetted, and wherein the times at which the rates of
16 irrigation of some of the evaporation chambers reach their respective peak
17 irrigation rates are different from those at which others of the evaporation
18 chambers do; and
19 a vapor guide defining a vapor path along which it directs to the at least one
20 condensation chamber vapor thereby produced in the plurality of evaporation
21 chambers;

22 ~~An evaporator and condenser unit as defined in claim 43~~ wherein the irrigation
23 system further includes:

24 A) a main sprayer system, ~~that~~ which irrigates each said evaporation
25 chamber for at least the majority of the time; and

26 B) an auxiliary sprayer system, ~~that~~ which irrigates each said at least one
27 evaporation chamber for only a minority of the time, the rate at which
28 each said evaporation chamber is irrigated while the auxiliary sprayer
29 system is irrigating it being at least twice the average irrigation rate
30 thereof.

1 21. (Canceled)

1 22. (Canceled)

1 23. (Currently Amended): An evaporator-and-condenser unit as defined in claim 51 further
2 including a compressor so interposed in the vapor path as to make the vapor pressure in the at
3 least one condensation chamber exceed that in the ~~at least one evaporation chamber~~
4 evaporation chambers.

1 24. (Currently amended): For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

3 A) a heat exchanger that forms at least one condensation chamber and at least one
4 evaporation chamber and includes heat-transfer surfaces by which heat passes
5 from the at least one condensation chamber to the at least one evaporation
6 chamber;

7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each said evaporation chamber has a respective average irrigation rate and
9 so varies as repeatedly to reach a respective peak irrigation rate that is at least
10 twice the average irrigation rate thereof, wherein the peak irrigation rate for
11 each said at least one evaporation chamber exceeds the steady-state rate
12 required to keep the heat-transfer surfaces thereof wetted, and the average
13 irrigation rate for each said at least one evaporation chamber is no more than
14 half the steady-state rate required to keep the heat-transfer surfaces of that
15 evaporation chamber wetted; and

16 C) a vapor guide defining a vapor path along which it directs to the at least one
17 condensation chamber vapor thereby produced in the at least one evaporation
18 chamber.

19 ~~An evaporator-and-condenser unit as defined in claim 17~~ wherein the heat exchanger
20 is a rotary heat exchanger in which the heat-transfer surfaces are mounted for rotation about a
21 central cavity from which the irrigation system irrigates the at least one evaporation chamber.

1 25. (Original): An evaporator-and-condenser unit as defined in claim 24 further including a
2 compressor so interposed in the vapor path as to make the vapor pressure in the at least one
3 condensation chamber exceed that in the at least one evaporation chamber.

1 26. (Previously Presented): An evaporator-and-condenser unit as defined in claim 45
2 wherein the irrigation system includes:

3 A) a main sprayer system, ~~that~~ which irrigates each said evaporation chamber for
4 at least the majority of the time; and

5 B) an auxiliary sprayer system, ~~that~~ which irrigates each said at least one
6 evaporation chamber for only a minority of the time, the rate at which each
7 said evaporation chamber is irrigated while the auxiliary sprayer system is
8 irrigating it being at least twice the average irrigation rate thereof.

1 27. (Original): An evaporator-and-condenser unit as defined in claim 26 further including a
2 compressor so interposed in the vapor path as to make the vapor pressure in the at least one
3 condensation chamber exceed that in the at least one evaporation chamber.

1 28. (Previously Presented): An evaporator-and-condenser unit as defined in claim 26
2 wherein:

3 A) the evaporator-and-condenser unit includes a plurality of said evaporation
4 chambers;

- 5 B) the auxiliary sprayer system includes at least one auxiliary-system nozzle,
6 associated with at least some of said evaporation chambers, from which the
7 auxiliary sprayer system produces an auxiliary-system spray; and
8 C) for each of the evaporation chambers with which the auxiliary-system nozzle
9 is associated, the auxiliary-system nozzle executes reciprocation between
10 positions in which the auxiliary-system spray irrigates that evaporation
11 chamber and positions in which the auxiliary-system spray does not irrigate
12 that evaporation chamber.

1 29. (Original): An evaporator-and-condenser unit as defined in claim 28 further including a
2 compressor so interposed in the vapor path as to make the vapor pressure in the at least one
3 condensation chamber exceed that in the at least one evaporation chamber.

1 30. (Withdrawn): For generating vapor from a liquid, a method comprising:

- 2 A) providing a heat exchanger that includes heat-transfer surfaces, forming at
3 least one condensation chamber and at least one evaporation chamber, by
4 which heat passes from the condensation chamber to the heat exchanger;
5 B) irrigating each said evaporation chamber at a respective irrigation rate that has
6 a respective average irrigation rate and so varies as repeatedly to reach a
7 respective peak irrigation rate that is at least twice the respective average
8 irrigation rate; and
9 C) directing into the at least one condensation chamber vapor thereby produced
10 in the at least one evaporation chamber.

1 31. (Withdrawn): A method as defined in claim 30 wherein each evaporation chamber's
2 irrigation rate reaches its peak irrigation rate periodically.

1 32. (Withdrawn): A method as defined in claim 30 wherein the method further includes so
2 compressing vapor in the vapor path as to make the vapor pressure in the at least one
3 condensation chamber exceed that in the at least one evaporation chamber.

1 33. (Withdrawn): A method as defined in claim 32 wherein each evaporation chamber's
2 irrigation rate reaches its peak irrigation rate periodically.

1 34. (Withdrawn): A method as defined in claim 30 wherein:

- 2 A) the peak irrigation rate for each evaporation chamber exceeds the steady-state
3 rate required to keep the heat-transfer surfaces thereof wetted; and
4 B) the average irrigation rate for each evaporation chamber is no more than half
5 the steady-state rate required to keep the heat-transfer surfaces of that
6 evaporation chamber wetted.

1 35. (Withdrawn): A method as defined in claim 34 wherein each evaporation chamber's
2 irrigation rate reaches its peak irrigation rate periodically.

1 36. (Withdrawn): A method as defined in claim 34 wherein the method further includes so
2 compressing vapor in the vapor path as to make the vapor pressure in the at least one
3 condensation chamber exceed that in the at least one evaporation chamber.

1 37. (Withdrawn): A method as defined in claim 36 wherein each evaporation chamber's
2 irrigation rate reaches its peak irrigation rate periodically.

1 38. (Previously presented): For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

- 3 A) a heat exchanger that forms at least one condensation chamber and at least one
4 evaporation chamber and includes heat-transfer surfaces by which heat passes
5 from the at least one condensation chamber to the at least one evaporation
6 chamber;
7 B) means for irrigating each said evaporation chamber at an irrigation rate that
8 has a respective average irrigation rate and so varies as repeatedly to reach a

9 respective peak irrigation rate that is at least twice the average irrigation rate
10 thereof; and

11 C) a vapor guide defining a vapor path along which it directs to the at least one
12 condensation chamber vapor thereby produced in the at least one evaporation
13 chamber.

1 39. (Canceled)

1 40. (Canceled)

1 41. (Previously Presented): An evaporator-and-condenser unit as defined in claim 11
2 wherein:

3 A) the evaporation-and-condenser unit includes a plurality of the evaporation
4 chambers; and

5 B) the times at which the rates of irrigation of some of the evaporation chambers
6 reach their respective peak irrigation rates are different from those at which
7 others of the evaporation chambers do.

1 42. (Currently amended): ~~A method~~ An evaporator-and-condenser unit as defined in claim
2 41 wherein each evaporation chamber's irrigation rate reaches its peak irrigation rate
3 periodically.

1 43. (Canceled)

1 44. (Canceled)

1 45. (Previously Presented): An evaporator-and-condenser unit as defined in claim 24
2 wherein:

3 A) the evaporation-and-condenser unit includes a plurality of the evaporation
4 chambers; and

5 B) the times at which the rates of irrigation of some of the evaporation chambers
6 reach their respective peak irrigation rates are different from those at which
7 others of the evaporation chambers do.

1 46. (Previously Presented): A method as defined in claim 45 wherein each evaporation
2 chamber's irrigation rate reaches its peak irrigation rate periodically.

1 47. (Currently amended) For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

3 A) a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the evaporation
6 chambers;

7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each said evaporation chamber has a respective average irrigation rate and
9 so varies as repeatedly to reach a respective peak irrigation rate that is at least
10 twice the average irrigation rate thereof, the times at which at least one of the
11 evaporation chambers reaches its peak irrigation rate differing from the times
12 at which at least one other of the evaporation chambers does, the irrigation
13 system including:

14 i) a main sprayer system, which irrigates each said evaporation chamber
15 for at least the majority of the time; and
16 ii) an auxiliary sprayer system, which irrigates each said at least one
17 evaporation chamber for only a minority of the time and includes at
18 least one auxiliary-system nozzle, associated with at least some of said
19 evaporation chambers for each of which that auxiliary-system nozzle
20 executes reciprocation between positions in which the auxiliary-
21 system spray irrigates that evaporation chamber and positions in which
22 the auxiliary-system spray does not irrigate that evaporation chamber,
23 the rate at which each said evaporation chamber is irrigated while the

24 auxiliary sprayer system is irrigating it being at least twice the average
25 irrigation rate thereof; and
26 C) a vapor guide defining a vapor path along which it directs to the at least one
27 condensation chamber vapor thereby produced in the ~~at least one evaporation~~
28 ~~chamber~~ plurality of evaporation chambers.

1 48. (Currently amended) For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

- 3 A) a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the plurality of
6 evaporation chambers;
7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each of the said evaporation chamber chambers has a respective average
9 irrigation rate and so varies as repeatedly to reach a respective peak irrigation
10 rate that is at least twice the average irrigation rate thereof, the times at which
11 at least one of the evaporation chambers reaches its peak irrigation rate
12 differing from the times at which at least one other of the evaporation
13 chambers does, the irrigation system including:
14 C) i) a main sprayer system, ~~that~~ which irrigates each of the said
15 evaporation chamber chambers for at least the majority of the time;
16 and
17 i) ~~the majority of the time~~; and
18 ii) an auxiliary sprayer system that irrigates each of the said ~~at least one~~
19 evaporation chamber chambers for only a minority of the time, the rate
20 at which each of the said evaporation chamber chambers is irrigated
21 while the auxiliary sprayer system is irrigating it being at least twice
22 the average irrigation rate thereof; and
23 D) C) a vapor guide defining a vapor path along which it directs to the at least one

24 condensation chamber vapor thereby produced in the ~~at least one evaporation~~
25 ~~chamber~~ evaporation chambers.

1 49. (Canceled)

1 50. (Currently amended) For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

3 A) a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the evaporation
6 chambers;

7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each said evaporation chamber has a respective average irrigation rate and
9 so varies as repeatedly to reach a respective peak irrigation rate that is at least
10 twice the average irrigation rate thereof, the times at which at least one of the
11 evaporation chambers reaches its peak irrigation rate differing from the times
12 at which at least one other of the evaporation chambers does, the evaporation
13 chambers' peak irrigation rates exceeding the steady-state rate required to
14 keep the heat-transfer surfaces thereof wetted, but the evaporation chambers'
15 average irrigation rates being no more than half that steady-state rate, the
16 irrigation system including:

17 i) a main sprayer system, which irrigates each of the said ~~evaporation~~
18 ~~chamber~~ chambers for at least the majority of the time; and
19 ii) an auxiliary sprayer system, which irrigates each of the said ~~at least~~
20 ~~one~~ evaporation chamber chambers for only a minority of the time, the
21 rate at which each of the said ~~evaporation chamber~~ chambers is
22 irrigated while the auxiliary sprayer system is irrigating it being at
23 least twice the average irrigation rate thereof;

- 24 C) a vapor guide defining a vapor path along which it directs to the at least one
25 condensation chamber vapor thereby produced in the at least one evaporation
26 chamber; and
27 D) a compressor so interposed in the vapor path as to make the vapor pressure in
28 the at least one condensation chamber exceed that in the ~~at least one~~
29 ~~evaporation chamber~~ evaporation chambers.

1 51. (Currently amended) For distilling a liquid, an evaporator-and-condenser unit
2 comprising:

- 3 A) a heat exchanger that forms at least one condensation chamber and a plurality
4 of evaporation chambers and includes heat-transfer surfaces by which heat
5 passes from the at least one condensation chamber to the evaporation
6 chambers;
7 B) a varying-rate evaporation-chamber irrigation system whose rate of irrigation
8 of each said evaporation chamber has a respective average irrigation rate and
9 so varies as repeatedly to reach a respective peak irrigation rate that is at least
10 twice the average irrigation rate thereof, the times at which at least one of the
11 evaporation chambers reaches its peak irrigation rate differing from the times
12 at which at least one other of the evaporation chambers does, the evaporation
13 chambers' peak irrigation rates exceeding the steady-state rate required to
14 keep the heat-transfer surfaces thereof wetted, but the evaporation chambers'
15 average irrigation rates being no more than half that steady-state rate, the
16 irrigation system including:
17 i) a main sprayer system, which irrigates each of the said evaporation
18 ~~chamber~~ chambers for at least the majority of the time; and
19 ii) an auxiliary sprayer system, which irrigates each of the evaporation
20 ~~chamber~~ chambers for only a minority of the time and includes at least
21 one auxiliary-system nozzle, associated with at least some of said
22 evaporation chambers for each of which that auxiliary-system nozzle
23 executes reciprocation between positions in which the auxiliary-

24 system spray irrigates that evaporation chamber and positions in which
25 the auxiliary-system spray does not irrigate that evaporation chamber,
26 the rate at which each of the said evaporation chamber chambers is
27 irrigated while the auxiliary sprayer system is irrigating it being at
28 least twice the average irrigation rate thereof; and
29 C) a vapor guide defining a vapor path along which it directs to the at least one
30 condensation chamber vapor thereby produced in the ~~at least one evaporation~~
31 ~~chamber~~ evaporation chambers.